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NAVY CLOTHING AND TEXTILE RESEARCH FACILITY NATICK MA F/6 6/17  
THE FITTING CHARACTERISTICS OF SAFETY BOOTS ON MILITARY WOMEN.(U)  
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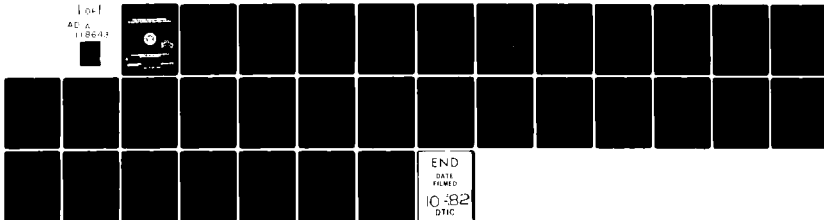
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20. ABSTRACT (Continue on reverse side if necessary and identify by block number) The Navy Clothing and Textile Research Facility (NCTRF) tested the fitting characteristics of men's safety boots carried in the Supply System on a representative sample of Navy women and concluded that more than 95% of military females can be fitted with footwear selected from sizes 4 to 10 in whole and half sizes, in widths extra narrow (XN), narrow (N), regular (R), wide (W), and extra wide (XW). The tariff will require sizes 2 and 3 (Continued on reverse side)		

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in widths XN, N, R, and W to accommodate the remaining "no fit" females of the population. The data also facilitated the development of a size guide for converting female shoe sizes to men's safety shoe sizes. The use of the size guide is recommended for fitting and requisitioning men's safety shoes for women, and the safety footwear for the military supply system is recommended for issue to military women. (U)

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## THE FITTING CHARACTERISTICS OF SAFETY BOOTS ON MILITARY WOMEN

### INTRODUCTION

The Navy Clothing and Textile Research Facility (NCTRF), assisted by Army, Air Force, and Marine Corps technologists, conducted a steel-toe safety-boot fitting evaluation among female recruits and female senior station personnel at the Naval Training Center, Orlando, FL. This study showed that more than 95 percent of female service personnel can be fitted with safety boots (NSN 8430-00-935-6235 series) built over the MIL-7 safety toe last (Figure 1). Based on this work, NCTRF developed a document titled THE GUIDE FOR FITTING AND MATCHING STANDARD DOD MEN'S SAFETY FOOTWEAR SIZES WITH WOMEN'S DRESS SHOE SIZES. The primary purpose of this evaluation was to determine the feasibility of fitting service women with the safety boot, which is high, leather-lined protective footwear, used mostly by Navy flight and construction battalion personnel. Another purpose was to establish a size equivalence relationship between the safety boots and the women's shoes (NSN 8435-00-577-5153 series). See Figure 2 from which the fitting guide would evolve. NCTRF initiated the study at the request of the Defense Personnel Support Center (DPSC) to learn whether men's military safety footwear in the DOD Supply System could fit military women assigned to hazardous duties. The use of men's footwear would also obviate dependence on insufficiently protective commercial women's safety shoes. DPSC at first proposed the development of high-strength, women's safety footwear, but preliminary work disclosed that designing suitable safety footwear exclusively for women would be extremely costly, time consuming, and would require 3 to 5 years to complete. Consequently, the safety boots, military safety footwear with a broad range of sizes, were chosen as the footwear with the best potential for fitting the female population.

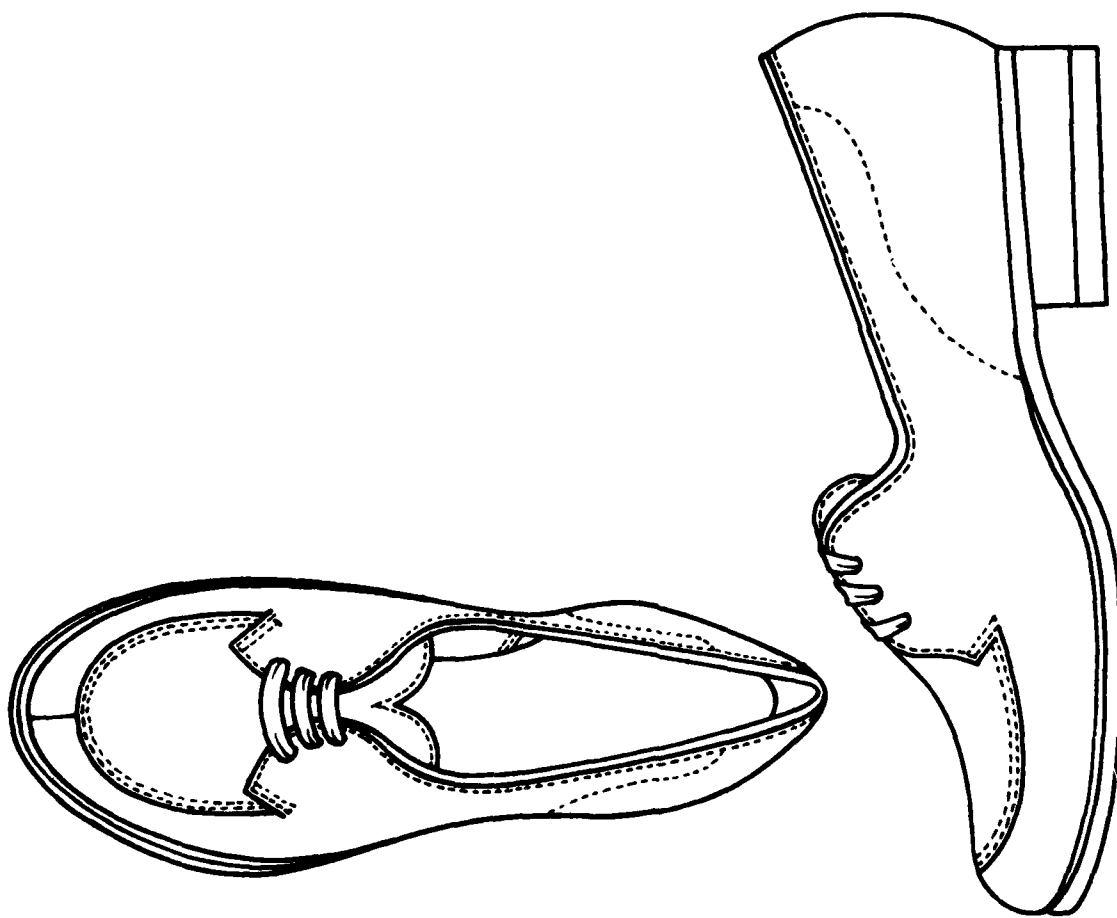
The feasibility of fit and the size equivalence relationship were established after a random group of 255 female personnel wore tubular terry cloth socks with safety footwear that included whole and half sizes and widths ranging from 4-1/2 extra narrow (XN) to 10XN, 4 narrow (N) to 10N, 4 regular (R) to 10R, and 8 wide (W), 8-1, 9-1/2W, and 10W. When both the boot size and the women's shoe size were accepted by the subject, they were recorded. Although the findings established the feasibility of fitting an overwhelming proportion of military women, the size equivalence data for men's and women's sizes indicated no precise one-to-one size relationship between the footwear of men and women. Different women wearing the same dress shoe size frequently required different sized men's boots. This variability was attributed to poorly fitted female dress shoes and to individual physiological differences not related to foot dimensions. The results showed that (a) more than 95 percent of military women can be fitted with safety boots, and (b) a size guide of first- and second-choice boot sizes correlated to women's dress shoe sizes can help individual women and organizations to requisition safety boots (see Table II and Appendix D).

To assure the essential size accommodation of the female population, NCTRF recommends that the Supply System stock a complete array of men's safety boots, including whole and half sizes from 4 to 10 and widths XN, N, R and W, and use the guide for requisitioning necessary sizes. NCTRF also recommends the wearing of terry-cloth tubular socks or cushion-soled socks to enhance the fit and comfort of the footwear. Finally, for those women who cannot be fitted with men's safety boot sizes, NCTRF recommends the development of new sizes and widths,



**FIGURE 1. STANDARD SAFETY BOOT**





**FIGURE 2. WOMEN'S SHOES**

namely, 2 and 3 N, R, and W.

The purpose of this report is to show how this evaluation was conducted and to detail the findings.

#### PROCEDURE

The investigation began with accumulation of 119 pairs of safety boots in sizes 4-1/2XN to 10XN, 4N to 10N, 4R to 10R, and some safety-toe chukkas in sizes 8W, 8-1/2W, 9W, 9-1/2W and 10W. All were made over the MIL-7 safety toe last with a #400 steel toe and were sent to the Naval Training Center (NTC), Orlando, Florida. NTC provided a fitting room with a platform 9 feet long, 3 feet wide and 34 inches high that permitted three subjects to be fitted simultaneously. The subjects were 255 randomly selected Navy women, including recruits and senior station women, assigned to the Center. The five fitters (two Navy, one Army, one Air Force and one Marine) were technologists who agreed on a concept of fit that would assure maximum foot comfort. Accordingly, the fitted boots had to feel neither too tight in the toe or metatarsal regions and not cause foot discomfort. The boots could not be so loose in the vamp that the creased leather would abrade the skin, nor so loose in the heel or at the instep that the subject's feet would shift excessively within the boots while she was walking. Prior to the fitting process, every subject completed the heading of the Fitting Data Form (FDF), Fitting Data of Boots, Safety on Women of NTC, Orlando, FL, including name, rank, date, age, length of service, height, weight, organization, and the size of the standard shoes, women's. (See Appendix A.)

When the subject mounted the fitting platform, the fitter checked the correctness of the FDF entries and issued the subject a pair of single-size, heavy, stretch tubular, acrylic, nylon socks, which she donned over her nylon hose. If the subject wore heavy work hose, she removed them and put on the tubular hose over her bare feet. The tubular socks were removed immediately after the fitting sequence and dropped into a container for use by subsequent subjects. Every subject wore the single-size stretch tubular socks during the fitting process.

The process began when the subject's right foot or left foot was measured on a paper grid (see Appendix B) with an accompanying size chart (see Appendix C), a system developed by the Navy to predict initial fitting sizes for military footwear built over the geometric MIL-1 military dress shoe last. The grid and chart were applicable to MIL-7 or military safety toe last footwear since the dimensions of MIL-1 and MIL-7 lasts are identical except for a slight difference in the toe region. The measuring system required the subject to place a foot on the grid, which enabled the fitter to determine its maximum length (L) and width (W). The L x W dimensions were used as coordinates on the size chart (Appendix C), which shows the shoe size; e.g., dimensions 9.3" x 3.5" equals 5-1/2R. After subjects were fitted and the correlated shoe and safety boot sizes were tabulated, the information was used to predict the initial fitting sizes of subsequent subjects and to test the probable effectiveness of the size correlations which would appear in the subsequent size guide.

When the dress shoe was obviously too large or too small, the fitters used a Brannock women's foot measuring device to determine the subject's apparent dress shoe size for the purpose of FDF record (Appendix A). If the predicted "try-on" boot size was not available, the closest substitute size was drawn from

the stock of test boots. One or more sizes were tried on, and the accepted size was recorded on the FDF. The fitting process proceeded until both the subject and the fitter were satisfied with the fit. When either the subject or the fitter felt the boot could not be fitted, or when the size was not available, the notation "No Fit" was made on the FDF. Each FDF was examined and handed to a recorder who entered the accepted boot size and the corresponding military women's dress shoe size on a chart of fitting equivalents. At the end of the test, the quantity of the sizes was totaled and entered in a summary table of fitting equivalencies. (See Table I, which subsequently was refined and extended to form Table II. See also Appendix D.)

In addition, 49 subjects chosen at random from the group of 255 walked in the boots from 5 to 15 minutes to verify the adequacy of fit and comfort. Each of these subjects then completed a questionnaire titled Boots, Safety Test (WT) (see Appendix E). Twenty-one of the 49 subjects, including company commanders who led recruits through vigorous marching exercises, continued to wear the boots for 2 months. These subjects subsequently gave us their comments concerning the comfort of the boots.

## DISCUSSION

### Fitting Data

Table I shows the fitting results of 255 female subjects fitted with the men's safety boots. The table matches the accepted safety boot sizes with the standard women's shoe sizes worn by subjects during the safety boot fittings. Of the 255 subjects, 11 could not be satisfactorily fitted from the sizes in the test tariff. Of the 11, 7 could have been fitted by sizes 4-1/2W, 5W, 5-1/2W, 6W, 7W and 7-1/2W, all of which are in the Supply System, but not in the inventory of test boots. No boots could have been obtained, however, for four subjects requiring estimated sizes 3-1/2N, 3R and 3-1/2R, which are not part of the safety-boots size tariff. Predicated on a potential 251:255 success ratio of randomly selected and representative subjects, the results indicate that more than 95 percent of the military females will be fitted by the existing safety boot tariff. The four "no fits" suggest that about 2 percent of the female population will not be fitted by the existing tariff.

### Fitting Experience

The test disclosed that some boots may require a wider gusset to accommodate subjects with high and wide insteps. These subjects had difficulty pushing their feet through the opening of some boots. When the gusset was slit, however, the problem disappeared. The subjects with high insteps then had no difficulty in pushing their feet into the boots.

### Tubular Socks

Thick, terry-cloth, tubular socks worn over nylons facilitated the fitting of the boots. The thick socks contributed bulk, filled the cavity of the boot, and enhanced the comfort and fit of the footwear.

TABLE I  
SAFETY BOOT SIZES VS. WOMEN'S SHOE SIZES  
AT NTC ORLANDO

SAFETY BOOT SIZES (FITTED) *		WOMEN'S SHOE SIZES (WORN)																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		4-1/2				5				5-1/2				6				6-1/2				7				7-1/2				8				NO FIT TOTAL																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																														
		A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																												
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\* Shoe Widths: N-Narrow; R-Regular; W-Wide.

TABLE I (CONTINUED)

SAFETY BOOT SIZES		WOMEN'S SHOE SIZES (WOMEN)																																																	
		7					7-1/2					8					8-1/2					9					9-1/2					10					NO FIT		TOTAL												
		A	B	C	D	E	A	B	C	D	E	AA	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E	A	B	C	D	E									
5-1/2	N																																																		
6-1/2	N																																																		
7	XN											1																																							
	N																																																		
	R																																																		
	W																																																		
7-1/2	N																																																		
	R																																																		
	W																																																		
	XN																																																		
8	N																																																		
	R																																																		
	W																																																		
8-1/2	N																																																		
	R																																																		
	W																																																		
9	N																																																		
	R																																																		
	W																																																		
	XN																																																		
Subtotal																																																			
Total (No Fit)																																																			

## Wear Test

Forty-nine randomly selected subjects walked in the boots from 5 to 15 minutes to verify the adequacy of fit and comfort. All reported the fit was satisfactory. Twenty-one of these subjects who continued the test for 2 months--doing marching drills, supply work, and recreational activities, including motorcycling and camping--reported the boots were comfortable. There were no reports of heel-slips, but a break-in period of 1 week was needed by some to condition their ankles. Although the weather at Orlando was warm (approximately 80°F), the thick, tubular socks did not detract significantly from comfort.

## Fitting Chart (Table II)

Unreliable data were generated from subjects whose dress shoes had been misfitted at retail stores and issue points prior to the test. Some of these subjects literally stepped out of their footwear while walking. Consequently, some of these poorly fitted subjects wearing 7-1/2B women's shoes during the test were fitted with nine different safety boot sizes ranging from 4-1/2W to 7N (see Table I). Table II was subsequently developed for first- and second-choice sizes from Table I. Similar variability was experienced by the Army when they conducted an informal fitting test on women using Army men's combat boots at Fort Devens, MA. (1) Table II is a refinement and extension of Table I. Obvious, non-correlating, unusual boot sizes obtained from subjects wearing dress shoe misfits listed in Table I have been omitted from Table II. The procedure for using Table II is described in Appendix D.

## Testing of Table I Size Equivalence Relationships

After fitting data for the first 75 subjects were accumulated, these beginning size matchings were used to predict the initial boot sizes of later subjects. The results suggested that most initial sizes predicted by the data in Table I were as precise as those of the measuring grid system (Appendixes B and C) used to predict the initial sizes. Applying either the fitting data or the grid system, the fitters seldom tried more than two different sizes to obtain the boot size acceptable to the subject.

## Use of Military Safety Footwear Besides Safety Boots

Safety boots were selected as the test footwear because they offered the advantages of height, a blucher pattern and a leather lining--which enhance the fit and comfort of footwear. No data were obtained, however, about the fitting characteristics of other stock safety shoes, which, nevertheless, are lower and styled differently. NCTRF believes that most military women can also be satisfactorily fitted with other military styles of safety footwear in the Supply System because they are made over the same MIL-7 lasts. These include: Shoes, Safety, MIL-S-21894; Shoes Conductive, MIL-S-3794; Shoe Molders, MIL-S-82245; Shoe, Safety, Non-Sparking, MIL-S-41821; Shoe, Safety, Men's Electrical Hazard, High, MIL-S-43860; Shoe, Safety, Men's Electrical Hazard, Oxford, MIL-S-43897. In all cases, the fit of the footwear, including safety boots, oxfords, and the low blucher footwear listed above, are improved by heavy-cushion-sole socks.

- (1) Discussion between author and E. R. Cargill of the Clothing Equipment and Materials Engineering Laboratory, U.S. Army Natick Laboratories, March 1977.

TABLE II  
CHART FOR FITTING AND MATCHING STANDARD DOD  
MEN'S SAFETY FOOTWEAR SIZES WITH WOMEN'S DRESS SHOE SIZES

<u>Sizes (Women's)</u>	<u>Sizes (Men's)</u>	<u>Sizes (Men's)</u>
Shoes, Women	Dod Safety Footwear	Dod Safety Footwear
MIL-S-21711	First Choice	Second Choice
4-1/2B	4N	4XN
4-1/2C	4N	4-1/2XN
5A	4-1/2XN	4-1/2N
5B	4-1/2N	4-1/2XN
5C	4-1/2N	4R
5D	4-1/2R	5N
5-1/2A	4-1/2N	5XN
5-1/2B	4-1/2R	5N
5-1/2C	4-1/2R	5N
5-1/2D	5R	5-1/2N
6A	5N	5-1/2XN
6B	5-1/2N	5R
6C	5-1/2N	5R
6D	5R	5-1/2N
6-1/2A	5R	5-1/2XN
6-1/2B	5R	5-1/2XN
6-1/2C	5-1/2R	5W
6-1/2D	5-1/2R	5W
7AA	5-1/2N	6XN
7A	5-1/2R	6-1/2N
7B	5-1/2R	6-1/2N
7C	6R	5-1/2R
7D	6-1/2N	7XN
7-1/2AA	6XN	5-1/2N
7-1/2A	6-1/2N	7XN
7-1/2B	6R	6-1/2N
7-1/2C	6-1/2R	7N
7-1/2D	6-1/2R	7N
8AA	7XN	6-1/2N
8A	7XN	6-1/2N
8B	7N	6-1/2R
8C	7-1/2N	8XN
8D	7-1/2R	7R
8-1/2AA	7XN	7N
8-1/2A	7N	7-1/2XN
8-1/2B	7R	7-1/2N
8-1/2C	7R	7W
8-1/2D	7-1/2N	8XN
9AA	8XN	7-1/2N
9A	8XN	7-1/2N
9B	7-1/2R	8R
9C	7-1/2R	8R
9D	8N	8R
10AA	8-1/2XN	8-1/2N
10A	8-1/2N	9XN
10B	8-1/2R	9N
10C	8W	8-1/2R
10D	8W	8-1/2R

## CONCLUSIONS

1. Safety boots will accommodate more than 95 percent of military women who require safety footwear.
2. It is feasible to issue other styles of military safety footwear with lower patterns built over the MIL-7 safety last to military women. Heavy-cushion-sole socks will enhance the fit of the safety shoes.

## RECOMMENDATIONS

NCTRF recommends:

1. Navy women use the men's safety boots and other Supply System footwear.
2. The Supply System stock safety footwear in whole and half sizes in the range of 4 to 10 and widths XN, N, R, W, and XW to assure a complete supply of sizes for women.
3. Additional safety shoe sizes 2 and 3 and widths N, R, and W be developed to accommodate the 2 percent of the Navy female population who cannot wear men's sizes.
4. Table II and Appendix E be used for fitting and requisitioning military safety footwear.
5. Cushion-sole socks be worn to assure superior fit and comfort.



#### ACKNOWLEDGEMENTS

The work of this investigation was assisted by Mr. Michael Loparto and Mr. Caesar Zemme of the Navy Clothing and Textile Research Facility; Mr. Robert I. Cargill, U.S. Army Natick Laboratories; Mr. Ralph Goodwin, Wright Patterson Air Force Base; and Mr. R. G. McCormick, Marine Corps Logistics Base, who participated in the fitting operations at the Naval Training Center, Orlando, FL. The clothing office of the Naval Administration Command, Naval Training Center was also of immeasurable help in setting up and in assembling female personnel who were the subjects of this study which has since been applied to the military women of all the Services.

APPENDIX A

NAVY CLOTHING AND TEXTILE RESEARCH FACILITY  
NATICK, MASSACHUSETTS 01760

FDF  
FITTING DATA OF BOOT'S SAFETY ON WOMEN OF NTC,  
ORLANDO, FLORIDA

Test Subject No \_\_\_\_\_ Shoe Fitter \_\_\_\_\_  
Name \_\_\_\_\_ Rank \_\_\_\_\_ Date \_\_\_\_\_  
Age \_\_\_\_\_ Length of Service \_\_\_\_\_ Height \_\_\_\_\_ Weight \_\_\_\_\_  
Organization \_\_\_\_\_

1. Military Women's Shoe Size
2. Fitted Sock Size \_\_\_\_\_
3. Predicted Shoe Size for Boots, Safety
  - a. Machine Right Foot \_\_\_\_\_ Left Foot \_\_\_\_\_ None \_\_\_\_\_
  - b. Grid Right Foot \_\_\_\_\_ Left Foot \_\_\_\_\_ None \_\_\_\_\_
4. Shoe Fitting
  - a. Initial try-on size \_\_\_\_\_
  - b. Follow up try-on sizes \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_
  - c. Determination of Fit Fitted Boot Size
    - (1) Test Subject
    - (2) Shoe Fitter
  - d. Reasons for No Fit
    - (1) Test Subject \_\_\_\_\_
    - (2) Shoe Fitter (Include information if Boot Size is not available) \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

#### APPENDIX B. SIZE MEASURING GRID

Appendix B is used for supply mail order footwear built over the MIL 1 or MIL 7 shoe last. Accordingly, this grid lends itself to use in predicting the sizes of safety shoes made over the U.S. MIL 7 last. The instructions on the grid were not applicable to the fitting situations at NTC Orlando. The scale of the grid on page B-2 is about 70% of the original.

130

120

110

100

90

80

70

60

50

40

30

20

10

INSTRUCTIONS FORMEASURING CUSTOMER MARKINGS ON BLANK

This grid is 13 inches long and 5 inches wide, sub-divided by 1/10 inch intervals. To determine the size of the customer's foot, place line "3" of customer's measurements on the base line and note the number of inches to the nearest 1/10, on the vertical scale opposite the line marked "1". The distance between lines "1" and "3" is the length of the foot to the nearest 1/10 inch. Then place line "4" against the vertical scale and note where line "2" falls on the horizontal scale. The distance between "2" and "4" is the width of the foot. Take the length and width values obtained and use the size chart on the next page to determine the shoe size. The sample markings on sheet two measure 10.6 inches by 4.0 inches (Size 9W).

10

20

30

40

50

APPENDIX C. CHART FOR PREDICTING SIZES OF SAFETY SHOES

Foot Length	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	Foot Length
88																					88
89		4 1/2	4 1/2	4 1/2	4 1/2																89
90		4 1/2	4 1/2	4 1/2	4 1/2																90
91			5 1/2	4 1/2	4 1/2																91
92			5 1/2	5 1/2	5 1/2	5 1/2															92
93			5 1/2	5 1/2	5 1/2	5 1/2															93
94			6 1/2	4 1/2	5 1/2	5 1/2															94
95				6 1/2	6 1/2	5 1/2															95
96				7 1/2	6 1/2	6 1/2															96
97				7 1/2	6 1/2	6 1/2	6 1/2	6 1/2													97
98					6 1/2	7 1/2	6 1/2	6 1/2	6 1/2												98
99					7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2											99
100					7 1/2	7 1/2	7 1/2	7 1/2	7 1/2	7 1/2											100
101					8 1/2	8 1/2	7 1/2	7 1/2	7 1/2	7 1/2											101
102					8 1/2	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2											102
103						8 1/2	8 1/2	8 1/2	8 1/2	8 1/2	8 1/2										103
104						9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2										104
105						9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2									105
106							9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2								106
107							10 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2	9 1/2							107
108							10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2							108
109							10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2						109
110								10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2						110
111									10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2	10 1/2						111
112										11 1/2	11 1/2	11 1/2	11 1/2	11 1/2	11 1/2	11 1/2					112
113										11 1/2	11 1/2	11 1/2	11 1/2	11 1/2	11 1/2	11 1/2					113
114										12 1/2	11 1/2	11 1/2	11 1/2	11 1/2	11 1/2	11 1/2					114
115											11 1/2	11 1/2	11 1/2	11 1/2	11 1/2	11 1/2	11 1/2				115
116											12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2				116
117											12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2			117
118											13 1/2	13 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2	12 1/2			118
119												12 1/2	12 1/2	13 1/2	12 1/2	12 1/2	12 1/2	12 1/2			119
120												13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2			120
121													13 1/2	13 1/2	13 1/2	13 1/2	13 1/2	13 1/2			121
122														14 1/2	13 1/2	13 1/2	13 1/2	13 1/2			122
123															14 1/2	14 1/2	14 1/2	14 1/2			123
124																14 1/2	14 1/2	14 1/2	14 1/2		124
125																	14 1/2	14 1/2	14 1/2	14 1/2	125
126																		14 1/2	14 1/2	14 1/2	126
127																			14 1/2	14 1/2	127
128																				14 1/2	128
129																				14 1/2	129

APPENDIX D. INSTRUCTION ON FITTING WOMEN'S SAFETY FOOTWEAR

DEPARTMENT OF THE NAVY  
NAVY FLEET MATERIAL SUPPORT OFFICE  
MECHANICSBURG, PA. 17055

AREA CODE 717  
790 • EXT: 3222  
AUTOVON 430 • EXT.

IN REPLY REFER TO:  
FMSOINST 10120.134A  
9923/ELT

JAN 10 1978

FMSO INSTRUCTION 10120.134A

From: Commanding Officer

Subj: Women's Safety Footwear

Ref: (a) DSAR 4235.18/NAVSUPINST 4400.70B

Encl: (1) Guide for Fitting and Matching Standard DOD Men's Safety  
Footwear Sizes with Women's Dress Shoe Sizes  
(2) List of Sizes and NSNs for Men's Safety Boot  
(3) List of Sizes and NSNs for Men's Conductive Shoe  
(4) List of Sizes and NSNs for Men's Electrical Hazards Pro-  
tective Shoe

1. Purpose. To provide data and revised procedures on subject footwear.
2. Cancellation. FMSO Instruction 10120.134.
3. Scope. This instruction is applicable to all ships and shore acti-  
vities having requirements for women's safety footwear.
4. General

a. There are no safety shoes or boots in the supply system designed specifically for women. The previous methods of supply were requisitioning men's electrical hazards protective shoes from Defense Personnel Support Center (DPSC) and direct purchase of women's safety shoes and conductive shoes from commercial sources. Navy Clothing and Textile Research Facility has advised that commercially available women's safety footwear does not meet the American National Standards Institute requirements; therefore, this method of supply is discontinued.

b. All safety footwear requirements for Navy women will be met by requisitioning men's safety footwear from DPSC through normal requisitioning channels. Enclosure (1), which was developed by a combined effort of all the Military Services, shows the correlation between sizes of the women's dress shoe (NSN Series 8435-00-577-5206) and the following men's safety footwear.

(1) Men's Safety Boot (NSNs listed on enclosure (2)). This item should be worn when a general purpose safety shoe for toe protection only is required. NOTE: The men's standard chukka safety shoe (NSN Series 8430-01-032-2900) will afford the same protection. Size correlation shown in enclosure (1) is applicable.

JAN 40 1978

Subj: Women's Safety Footwear

(2) Men's Conductive Shoe (NSNs listed on enclosure (3)). This item should be worn by personnel in areas having conductive floors where a static discharge could ignite or detonate sensitive explosive materials, gas mixtures or flammable vapors.

(3) Men's Electrical Hazards Protective Shoe (NSNs listed on enclosure (4)). This shoe should be worn wherever the hazard of an electrical shock exists. It is designed to insulate against shock or prevent a direct path to ground if wearer steps on or comes in contact with an energized source.

5. Action. Ships and shore activities requiring women's safety footwear will:

- a. Determine needs with the aid of enclosures (1) through (4).
- b. For items listed on enclosures (2), (3) and (4), submit requisitions through normal requisitioning channels.
- c. For sizes not carried in the supply system and not listed in enclosures (2), (3) and (4):

(1) Submit requisitions in accordance with the special measurement procedures outlined in reference (a).

(2) Forward FMSO (9923) a three year forecast of requirements, by size, not later than 1 March 1978. If total Navy requirements for a particular size warrants centralized procurement and stocking, FMSO will initiate action to have that size available in the supply system.



R. B. ABELE  
By direction

Distribution:

X-1, Col 1  
X-2, Col 1  
X-3, Col 1 (Less Parts I, J, and L)  
X-4, Col 1 (less Parts A, C, H, J, M, N, O, P, Q, R, and U)

Internal Distribution:

F, F1, F6, F20 (99, 992, 9923 - one copy each)



JAN 10 1978

GUIDE FOR FITTING AND MATCHING STANDARD DOD  
MEN'S SAFETY FOOTWEAR SIZES WITH WOMEN'S DRESS SHOE SIZES

INSTRUCTIONS

1. The purpose of this size guide is to enable prospective female users and organizations to requisition suitably fitting men's safety footwear from the supply system. This will be done by checking women's dress shoe sizes (column 1) being worn against corresponding men's safety footwear sizes listed as first and second choices respectively in columns two and three.
2. For example, personnel wearing women's shoe size 5½B will usually be satisfactorily fitted either by a man's 4½R, the first choice, or by 5N, the second choice, safety footwear item. If the first choice does not fit, the customer should try the second choice. If the first and second choices do not fit, nearby sizes should be tried depending on the cause as follows: when the fit is too tight, the customer should be fitted with a wider size. Accordingly, a tight 5N should be exchanged for a wider 5R. When the fit of a 5N is loose, it should be exchanged for a 4½N; if 5N is too short, it should be replaced by 5½N. Sometimes several try-ons may be necessary before a satisfactory fit is achieved.
3. To facilitate a satisfactory fit and foot comfort when wearing safety footwear, female personnel should wear thick commercial socks or standard cushion sole black socks available from the supply system under NSN 8440-00-543-7777 (small); NSN 8440-00-543-7778 (medium) and NSN 8440-00-543-7779 (large).
4. Men's safety footwear in sizes 4 to 10, including half sizes and in widths XN, N, R, and W, should fit almost the entire Military female population. It is recognized, however, that all sizes are not currently stocked because no specific requirement has been established to date by the customer. In addition, some women with very small feet, requiring men's sizes 3½ or less, will not be able to be fitted. In such rare cases, it may be necessary to invoke the special measurement procedures outlined in DSAR 4235.18/NAVSUPINST 4400.70B.

Enclosure (1)

DISJOINT 10120.134A

JAN 10 1978

<u>SIZES (WOMEN)</u> <u>SHOES, WOMEN</u> <u>MIL-S-21711</u>	<u>SIZES (MEN'S)</u> <u>DOD SAFETY FOOTWEAR</u> <u>FIRST CHOICE</u>	<u>SIZES (MEN'S)</u> <u>DOD SAFETY FOOTWEAR</u> <u>SECOND CHOICE</u>
4½B	4N	4XN
4½C	4N	4½XN
5A	4½XN	4½N
5B	4½N	4½XN
5C	4½N	4R
5D	4½R	5N
5½A	4½N	5XN
5½B	4½R	5N
5½C	4½R	5N
5½D	5R	5½N
6A	5N	5½XN
6B	5½N	5R
6C	5½N	5R
6D	5R	5½N
6½A	5R	5½XN
6½B	5R	5½XN
6½C	5½R	5W
6½D	5½R	5W
7AA	5½N	6XN
7A	5½R	6½N
7B	5½R	6½N
7C	6R	5½R
7D	6½N	7XN
7½AA	6XN	5½N
7½A	6½N	7XN
7½B	6R	6½N
7½C	6½R	7N
7½D	6½R	7N
8AA	7XN	6½N
8A	7XN	6½N
8B	7N	6½R
8C	7½N	8XN
8D	7½R	7R

Enclosure (1)

FMISOINST 10120.134A

JAN 10 1978

SIZES (WOMEN)	SIZES (MEN'S)	SIZES (MEN'S)
SHOES, WOMEN	DOD SAFETY FOOTWEAR	DOD SAFETY FOOTWEAR
MIL-S-21711	FIRST CHOICE	SECOND CHOICE
8½AA	7XN	7N
8½A	7N	7½XN
8½B	7R	7½N
8½C	7R	7W
8½D	7½N	8XN
9AA	8XN	7½N
9A	8XN	7½N
9B	7½R	8R
9C	7½R	8R
9D	8N	8R
10AA	8½XN	8½N
10A	8½N	9XN
10B	8½R	9N
10C	8W	8½R
10D	8W	8½R

Enclosure (1)

JAN 10 1978

BOOT, SAFETY (MEN'S)

Black leather, high blucher, steel box toe, rubber heel and sole, nonskid and nonmarking, jet fuel resistant & water resistant, 8" high, MIL-B-21408.

<u>SIZE</u>	<u>STANDARD NSN</u>	<u>SIZE</u>	<u>STANDARD NSN</u>
5N	8430-00-624-2151	9XN	8430-00-624-2870
5R	2155	9N	2873
5W	2186	9R	2905
5XW	2331	9W	2918
		9XW	2961
5½N	2332		
5½R	2337	9½XN	2963
5½W	2350	9½N	2964
5½XW	2459	9½R	2980
		9½W	2983
6N	2643	9½XW	3022
6R	2655		
6W	2658	10XN	3130
6XW	2659	10N	3131
		10R	3135
6½N	2662	10W	3187
6½R	2674	10XW	3188
6½W	2675		
6½XW	2721	10½XN	3192
		10½N	3193
7N	2722	10½R	3197
7R	2726	10½W	3198
7W	2727	10½XW	3224
7XW	2738		
		11XN	3225
7½N	2745	11N	3246
7½R	2746	11R	3249
7½W	2751	11W	3256
7½XW	2752	11XW	3287
8XN	2753	11½XN	3288
8N	2755	11½N	3292
8R	2756	11½R	3313
8W	2760	11½W	3315
8XW	2764	11½XW	3341
8½XN	2765	12XN	3342
8½N	2777	12N	3343
8½R	2797	12R	3361
8½W	2839	12W	3362
8½XW	2843	12XW	3405

Enclosure (2)

MEMO INST 10120.134A

JAN 10 1978

<u>SIZE</u>	<u>STANDARD NSN</u>
12½XN	8430-00-624-3410
12½N	3417
12½R	3429
12½W	3456
12½XW	3463
13XN	3464
13N	3465
13R	3477
13W	3478
13XW	3514
13½XN	3526
13½N	3535
13½R	3555
13½W	3566
13½XW	3576
14XN	3673
14N	3688
14R	3717
14W	3733
14XW	3734

Enclosure (2)

JAN 10 1978

SHOE, CONDUCTIVE (MEN'S)

Black leather, oxford, steel  
box toe, rubber heel and sole,  
oil resistant, MIL-S-3794

<u>SIZE</u>	<u>STANDARD NSN</u>	<u>SIZE</u>	<u>STANDARD NSN</u>
5R	8430-00-924-9319	9XN	8430-00-925-0431
5W	9329	9N	0453
5XW	761-3433	9R	0454
		9W	0463
		9XW	0464
5½R	761-3434	9½XN	925-0467
5½W	3443	9½N	0468
5½XW	3355	9½R	761-7834
		9½W	925-0482
6R	761-3356	9½XW	0490
6W	924-9451		
6XW	761-8773		
6½N	761-4204	10XN	925-0503
6½R	4205	10N	0508
6½W	6922	10R	0578
6½XW	6956	10W	0617
		10XW	0629
7XN	761-6962		
7N	924-9649	10½XN	925-0635
7R	9659	10½N	0637
7W	761-4187	10½R	0759
7XW	924-9666	10½W	0808
		10½XW	0859
7½XN	761-4720		
7½N	4767	11XN	925-0860
7½R	3600	11N	0903
7½W	3445	11R	0904
7½XW	3444	11W	0948
		11XW	0951
8XN	925-0083		
8N	0086	11½XN	925-0952
8R	0109	11½N	0953
8W	0112	11½R	0954
8XW	0186	11½W	0955
		11½XW	0956
8½XN	925-0189		
8½N	0211		
8½R	0229		
8½W	0230		
8½XW	0339		

Enclosure (3)

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<u>SIZE</u>	<u>STANDARD NSN</u>
12N	8430-00-761-7028
12R	925-1039
12W	1076
12XW	1090
13N	925-1116
13R	1148
13W	1228

Enclosure (3)

SHOE, ELECTRICAL HAZARDS PROTECTIVE (MEN'S)

Black leather, high top, steel box toe, rubber chloro-  
prene heel and sole, oil resistant, MIL-S-43860

<u>SIZE</u>	<u>STANDARD</u>	<u>NSN</u>		<u>SIZE</u>	<u>STANDARD</u>	<u>NSN</u>
4R	8430-00-611-8314	*		8N	8430-00-611-8699	
4W	8315	*		8R	8701	
4XW	8322	*		8W	8706	
				8XW	8718	
4½R	8324	*				
4½W	8327	*		8½N	8725	
4½XW	8329	*		8½R	8727	
				8½W	8734	
5XN	8330	*		8½XW	8736	
5N	8331	*				
5R	8332	*		9N	8744	
5W	8334	*		9R	8747	
5XW	8648			9W	8753	
				9XW	8755	
5½XN	8338	*				
5½N	8342	*		9½N	8763	
5½R	8344	*		9½R	8774	
5½W	8345	*		9½W	8775	
5½XW	8349	*		9½XW	8776	
6N	8364	*		10N	8777	
6R	8366	*		10R	8778	
6W	8368	*		10W	8779	
6XW	8380	*		10XW	8780	
6½N	8649			10½N	8781	
6½R	8655			10½R	8782	
6½W	8663			10½W	8784	
6½XW	8673			10½XW	8785	
7N	8674			11N	8786	
7R	8675			11R	8813	
7W	8676			11W	8814	
7XW	8681			11XW	8816	
7½N	8682			11½N	8817	
7½R	8684			11½R	8822	
7½W	8694			11½W	8830	
7½XW	8696			11½XW	8832	

Enclosure (4)



FMSOINST 10120.134A  
JAN 10 1978

<u>SIZE</u>	<u>STANDARD NSN</u>
12N	8430-00-611-8834
12R	8835
12W	8836
12XW	8837
12½N	8432 *
12½R	8464 *
12½W	8465 *
13N	8466 *
13R	8493 *
13W	8509 *
13½R	8626 *
14R	8633 *
14W	8641 *

\* Navy is not a registered user, and the NSN will not appear in the NMDL; however, the item may be requisitioned from DPSC through regular requisitioning channels.

Enclosure (4)

APPENDIX E

NAVY CLOTHING AND TEXTILE RESEARCH FACILITY  
NATICK, MASSACHUSETTS 01760

WT  
BOOTS, SAFETY WEAR TEST

Test Subject No. \_\_\_\_\_ Shoe Fitter \_\_\_\_\_

Name \_\_\_\_\_ Rank \_\_\_\_\_ Date \_\_\_\_\_

Age \_\_\_\_\_ Length of Service \_\_\_\_\_ Height \_\_\_\_\_ Weight \_\_\_\_\_

Organization \_\_\_\_\_

Military Women's Shoe Size \_\_\_\_\_ Fitted Boot Size \_\_\_\_\_

1. The fit of my boots is:

Just right \_\_\_\_\_ Slightly loose \_\_\_\_\_ Slightly tight \_\_\_\_\_

Much too tight \_\_\_\_\_ Much too loose \_\_\_\_\_

If much too tight or much too loose, please explain in space

No. 3 below.

2. As to comfort, I find these safety boots:

Excellent \_\_\_\_\_ Good \_\_\_\_\_ Average \_\_\_\_\_

Fair \_\_\_\_\_ Poor \_\_\_\_\_

If poor, please explain in space No. 3 below.

3. If you have other comments, complaints or suggestions, please write them in the space below; (i.e. Boots too long, too short, too tight, too narrow) \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Signature of Subject